

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A machine-implemented method, comprising:
synchronizing a carrier ~~frequency-signal~~ of a mobile station with a carrier ~~frequency-signal~~ of a base station in a cellular mobile communication system, the synchronizing including:

determining and/or predicting a frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station; and

determining and/or predicting, separately from determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station, a frequency variation that occurs when there is a change in location of the mobile station relative to the base station; and

when a large frequency variation is determined and/or predicted, synchronizing, using an AFC algorithm, ~~the~~ a carrier frequency of the carrier signal of the mobile station with ~~the~~ a carrier frequency of the carrier signal of the base station more frequently than is the case when a small frequency variation is determined and/or predicted.

2. (Previously Presented) A method as claimed in claim 1, comprising making a distinction in the mobile station between whether the frequency variation is due to a change in temperature or to a change in location, the making including making a distinction between the proportion of the frequency variation that is due to a change in temperature and the proportion that is due to a change in location.

3. (Previously Presented) A method as claimed in claim 2, wherein making the distinction includes determining whether the course followed by the frequency variation is steady or abrupt.

4. (Previously Presented) A method as claimed in claim 1, comprising processing together the frequency variations that result from a change in temperature and/or a change in location, the processing including detecting canceling out by superimposition.

5. (Previously Presented) A method as claimed in claim 1, comprising obtaining in the mobile station a measured variable from which conclusions are drawn as to the absolute temperature of the mobile station.

6. (Previously Presented) A method as claimed in claim 5, comprising determining a time-based temperature gradient from measured variables.

7. (Previously Presented) A method as claimed in claim 5, comprising storing in the mobile station a curve for the frequency variation as a function of temperature, which curve is characteristic of the mobile station, the storing including storing the curve as a table such that a value corresponding to an expected change in frequency can be read out from this table.

8. (Previously Presented) A method as claimed in claim 7, comprising storing in the table an exactness indicator that indicates how high a probability is of the value stored in the table matching an actual current shape of the characteristic curve.

9. (Previously Presented) A method as claimed in claim 7, comprising, when manufacturing the mobile station, preloading the table by measuring certain plotting points on the characteristic curve, or by shifting a typical, known characteristic curve in translation by an additive value that has been obtained by measuring a single plotting point.

10. (Previously Presented) A method as claimed in claim 8, comprising, when manufacturing the mobile station, preloading the table with values for a typical, known characteristic curve without any measurements.

11. (Previously Presented) A method as claimed in claim 7, comprising determining or updating the individual characteristic curve by teach-in processes during the operation of the mobile station.

12. (Previously Presented) A method as claimed in claim 8, wherein values of the table that are preloaded at the time of manufacture have a lower exactness indicator and values measured when a standard of reception is good have a high exactness indicator, the method comprising replacing values having a low exactness indicator by values having a high exactness indicator.

13. (Previously Presented) A method as claimed in claim 1, comprising storing in the mobile station a heating-up curve that is typical of the mobile station and that represents operation-related changes in temperature with time, the storing including storing the heating-up curve as a table or as parameters of an exponential function of the heating-up curve, from which an expected change in temperature can be estimated in advance.

14. (Previously Presented) A method as claimed in claim 13, wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes estimating in advance the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station by correlating the heating-up curve with a characteristic curve.

15. (Previously Presented) A method as claimed in claim 1, comprising identifying in advance critical states that affect temperature, wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the

temperature of the mobile station includes estimating frequency variations based on the identified critical states.

16. (Previously Presented) A method as claimed in claim 1, wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes estimating a temperature-related frequency error before any measurement of the frequency error.

17. (Previously Presented) A method as claimed in claim 1, comprising, when measurements of the frequency variation are not possible due to poor reception conditions, estimating a temperature-related frequency error and taking into account the temperature-related frequency error during the synchronizing.

18. (Previously Presented) A method as claimed in claim 1, wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes, before measuring actual temperature changes or frequency variation, estimating the change in temperature to be caused by a mode of operation of the mobile station, wherein estimating the change in temperature to be caused by the mode of operation includes estimating the change in temperature to be caused by transmitted power and/or, in the case of a TDMA-based mobile station, the number of time slots occupied in a transmitting mode.

19. (Previously Presented) A method as claimed in claim 1, comprising determining in advance a probability of an imminent jump in frequency, the determining including:

determining the probability of imminent travel past and below the base station,
and

determining the probability of an imminent change of cells.

20. (Previously Presented) A method as claimed in claim 19, wherein determining the probability of imminent travel past and below the base station includes:

determining the probability in an idle mode from a change in a reception time of arrival and/or from a received power on a reception frequency, and

determining the probability in a dedicated mode from a change in a transmission timing advance and from a change in a reception time of arrival and/or from a received power on a reception frequency.

21. (Previously Presented) A method as claimed in claim 19, wherein determining the probability of imminent travel past and below the base station includes:

determining the probability in an idle mode based on a reception time of arrival approaching a minimum and/or a received power on a reception frequency exceeding a threshold level,

determining the probability in a dedicated mode based on a transmission timing advance approaching a minimum, based on a reception time of arrival approaching a minimum and/or a received power on a reception frequency exceeding a threshold level.

22. (Previously Presented) A method as claimed in claim 19, wherein determining the probability of an imminent change of cell includes:

determining the probability in an in an idle mode from a power measured in adjacent cells, and

determining the probability in a dedicated mode from signaling to initiate a change of cell and from a power measured in adjacent cells.

23. (Previously Presented) A method as claimed in claim 1, comprising:
measuring current reception conditions, including received field strength and/or a signal-to-noise ratio of a received signal, and

deriving, from the measuring, control parameters, including a length of an AFC control interval, a conversion by an AFC final controlling element, and an exactness indicator.

24. (Previously Presented) A method as claimed in claim 1, wherein the AFC algorithm adjusts a length of AFC measuring intervals as a function of a size of past and expected changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted.

25. (Previously Presented) A method as claimed in claim 1, wherein the AFC algorithm adjusts a length of an AFC control interval as a function of a size of past and expected changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted, and/or when reception conditions are good.

26. (Previously Presented) A method as claimed in claim 1, wherein the AFC algorithm adjusts a frequency conversion by a AFC final controlling element as a function of a size of past and expected changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted, and/or when reception conditions are good.

27. (Previously Presented) A method as claimed in claim 1, wherein the AFC algorithm adjusts a memory of measured values as a function of a size of past and expected changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted, and/or when reception conditions are good.

28. (Previously Presented) A method as claimed in claim 1, wherein the synchronizing includes re-adjusting a reference-frequency oscillator that has no temperature-compensating circuitry and that has an individual characteristic curve having a maximum frequency variation from a nominal frequency of more than ± 3 ppm in an operating temperature range.

29. (Previously Presented) A method as claimed in claim 28, comprising measuring a temperature of the reference-frequency oscillator using a temperature sensor.

30. (Previously Presented) A mobile station, comprising:

a reference-frequency oscillator configured to provide a carrier signal with a carrier frequency; and

a controlling element configured to re-adjust the reference-frequency oscillator and synchronize the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station, the controlling element including:

means for determining and/or predicting a frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station separately from determining and/or predicting a frequency variation that occurs when there is a change in the location of the mobile station relative to the base station; and

synchronizing means for synchronizing the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station using an AFC algorithm, the synchronizing means synchronizing the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station more frequently when a large frequency variation is determined and/or predicted than is the case when a small frequency variation is determined and/or predicted.

31. (Previously Presented) A microprocessor for a mobile station, the microprocessor comprising:

means for determining and/or predicting separately a frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station and a frequency variation that occurs when there is a change in the location of the mobile station relative to a base station and

synchronizing means for synchronizing a carrier frequency of a reference-frequency oscillator with a carrier frequency of the base station using an AFC algorithm, the synchronizing means synchronizing the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station more frequently when a large frequency variation is determined and/or predicted than is the case when a small frequency variation is determined and/or predicted.

32. (Previously Presented) A method as claimed in claim 1 wherein the synchronizing includes re-adjusting a reference-frequency oscillator using a controlling element.

33. (Previously Presented) A mobile station as claimed in claim 30, wherein the controlling element includes means for making a distinction in the mobile station between whether the frequency variation is due to a change in temperature or to a change in location, including making a distinction between the proportion of the frequency variation that is due to a change in temperature and the proportion that is due to a change in location.

34. (Previously Presented) A mobile station as claimed in claim 30, wherein the controlling element includes means for processing together the frequency variations that result from a change in temperature and/or a change in location, the processing including detecting canceling out by superimposition.

35. (Previously Presented) A mobile station as claimed in claim 30, wherein the controlling element includes means for storing in a memory of the mobile station a curve for the frequency variation as a function of temperature, which curve is characteristic of the mobile station, the means for storing including means for storing the curve as a table such that a value corresponding to an expected change in frequency can be read out from this table.

36. (Previously Presented) A microprocessor as claimed in claim 31, comprising means for making a distinction in the mobile station between whether the frequency variation is due to a change in temperature or to a change in location, including making a distinction between the proportion of the frequency variation that is due to a change in temperature and the proportion that is due to a change in location.

37. (Previously Presented) A microprocessor as claimed in claim 31, comprising means for processing together the frequency variations that result from a change in

temperature and/or a change in location, the processing including detecting canceling out by superimposition.

38. (Previously Presented) A microprocessor as claimed in claim 31, comprising means for storing in a memory of the mobile station a curve for the frequency variation as a function of temperature, which curve is characteristic of the mobile station, the means for storing including means for storing the curve as a table such that a value corresponding to an expected change in frequency can be read out from this table.

39. (New) A method as claimed in claim 1 wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes determining the change in temperature of the mobile station using a temperature sensor.

40. (New) A method as claimed in claim 1 wherein the synchronizing is controlled by a mobile station processor configured to implement the determining and/or predicting steps.

41. (New) A method as claimed in claim 1, further comprising: receiving an input signal from the base station at a transceiver of the mobile station, wherein determining and/or predicting the frequency variation that occurs when there is a change in location of the mobile station relative to the base station includes a mobile station processor determining the frequency variation that occurs when there is a change in location of the mobile station relative to the base station based on the input signal received at the transceiver.